

cause impacts to approximately 31 acres, yet it proposes no runway extension. Alternative 3, which proposes the construction of a 500-foot runway extension, would cause impacts to approximately 33.2 acres, just 2.2 acres more than Alternative 2. Thus, 93 percent of the impact to ponds and mangroves in Alternative 3 is caused by the construction of the runway safety area and 7 percent of the impact is caused by the runway extension. Similar ratios occur for the other alternatives that propose runway extensions.

With respect to the issue of financial factors, the evaluation matrix reveals that costs, like environmental impacts, are driven primarily by the construction of a standard runway safety area, not the runway extensions. Roughly 80 percent of the cost for the alternatives that propose runway extensions is attributable the construction of the safety area, while the remaining 20 percent is attributable to the construction of a runway extension.

Airfield alternatives were initially presented to the master plan update Advisory Committee on February 28, 2002. The airfield alternatives were again presented to the Advisory Committee on January 30, 2003 for the purpose of selecting a preferred alternative. A wide-ranging discussion occurred at the meeting concerning the merits of airfield alternatives and the potential impacts to surrounding wetlands, salt ponds, and mangroves. It was noted that a feasibility study for the construction of a standard runway safety area was being conducted to define the possibilities for mitigating impacts to the surrounding environment. Thus, the selection of the preferred alternative was predicated on the assumption that the results of feasibility study will enable the FAA to make a decision that the construction of a standard runway safety area at the airport is feasible. If the FAA determines that the construction of a standard runway safety area is not feasible, the selection of a preferred airfield alternative will have to be revised.

Seven members of the Advisory Committee indicated a preference for Alternative 5B, five members indicated a preference for Alternative 1, and four members indicated a preference for Alternative 3A. On the basis of those results, Alternative 5B was included as the preferred alternative.

### 4.3 TERMINAL AREA CONCEPTS

In addition to development alternatives for the airfield, the master plan update also examined methods of providing additional terminal area facilities. As noted in the preceding section, the existing passenger terminal has severe deficiencies that must be addressed during the study period in order to accommodate projected levels of passengers in a safe and efficient manner. In addition, the demand capacity analysis indicated demand would occur for additional automobile parking during the study period.

Unlike the alternatives that were developed for the airfield, which are fairly specific in terms of runway length and width, methods of providing improvements to the terminal area are less specific and broader in scope. Thus, the term "concept" has been substituted in lieu of "alternative". This reflects the fact that any of these concepts would require further evaluation and would be subject to revision during any subsequent design process.

Before discussing the concepts developed, it is important to recognize that the locations where new terminal facilities could be considered is fairly small and is constrained by a number of existing facilities. These facilities include those listed below by direction from the existing passenger terminal:

- To the west - the new ARFF station opened in 2001.
- To the east - the FIS building which was opened in 1997.
- To the north – the aircraft ramp which is critical to the operation of the airport and cannot be reduced in size.
- To the south – the East Martello Museum which is listed on the National Register of Historic Places.

The area left for consideration of new terminal facilities is fairly small and requires that concepts propose the reconstruction of facilities in their current location. This means that significant disruption to existing operations would be required with nearly all concepts. However, the degree of disruption would vary considerably between concepts.

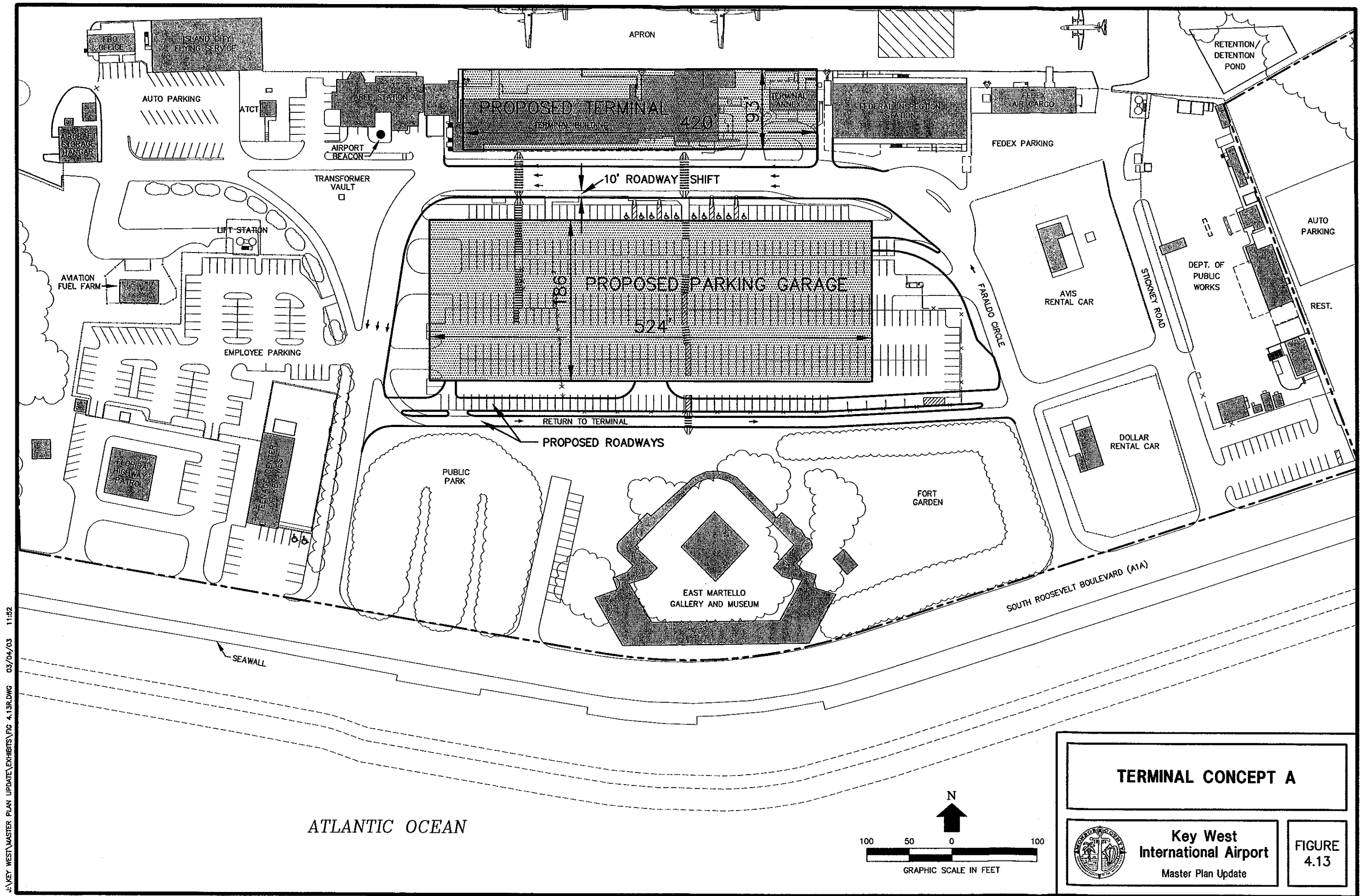
The following paragraphs present a series of concepts that were developed for the terminal area. The primary focus of these concepts is the provision for the construction of a new passenger terminal to accommodate projected levels of future passengers.

#### 4.3.1 TERMINAL CONCEPT A

As shown in Figure 4.13, Concept A consists of the construction of a new passenger terminal in the same place as the existing passenger terminal and using all space between the existing ARFF station and the F.I.S. Building. This terminal would provide approximately 39,000 square feet of space on the first floor and the balance of the required space, approximately 10,000 square feet on the second floor.

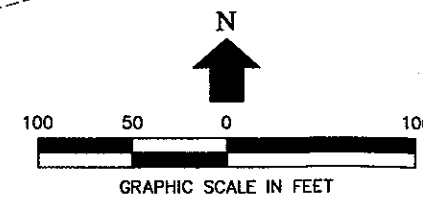
According to the Federal Emergency Management Agency Flood Insurance Rate Map of Monroe County, the area where the terminal would be constructed is located in a coastal flood zone with velocity hazard (i.e., wave action) and has a base elevation of 10. This means that a building in this location must be elevated such that its lowest supporting floor beam is clear of the base elevation. To meet this requirement, the terminal would have to be elevated. A typical cross section for Concept A is shown in Figure 4.14.

As the cross section indicates, the first floor would have a finished floor elevation of 15 feet. This would provide approximately 7.5 feet of clearance under the building that would allow for unrestricted work area for airline employees and baggage carts and would keep the building clear of the base flood elevation.

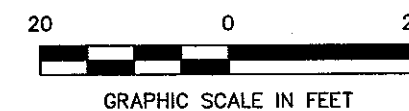
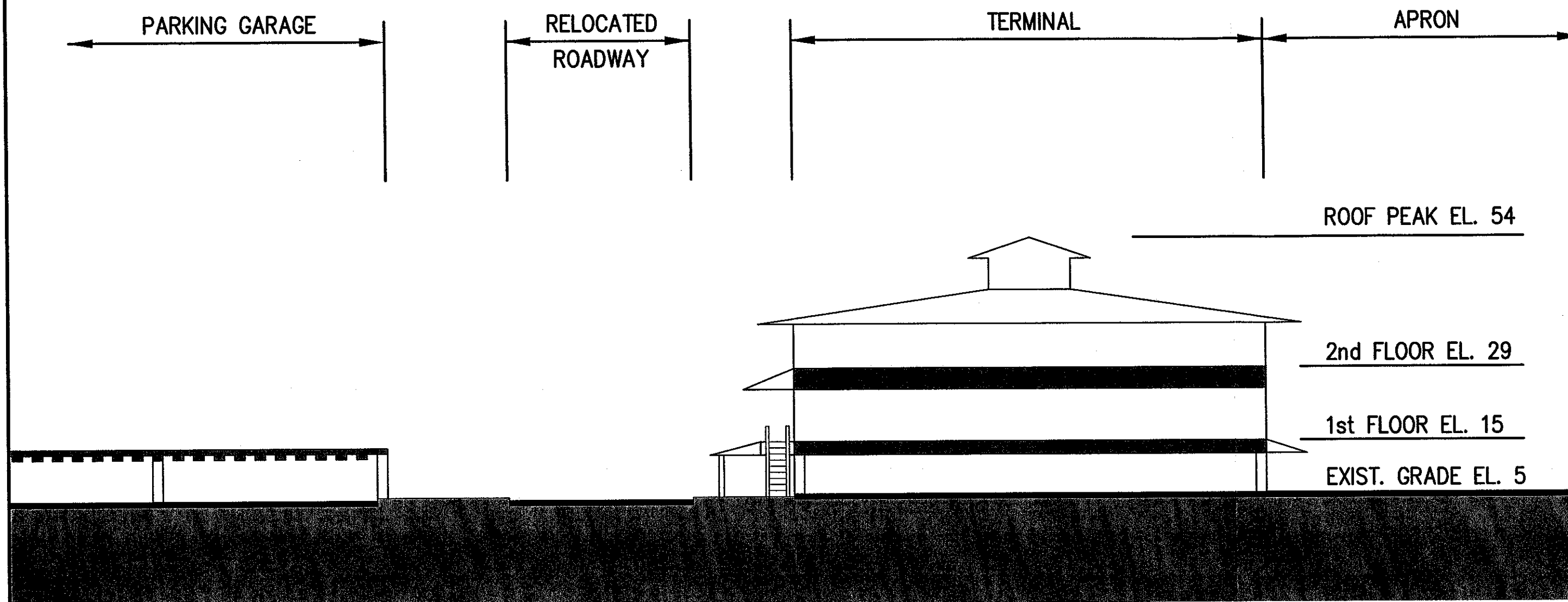


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<h2>TERMINAL CONCEPT A</h2>		
	<h3>Key West International Airport</h3>	
	<p>Master Plan Update</p>	
		<h3>FIGURE 4.13</h3>



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### TERMINAL CONCEPT A CROSS SECTION



Key West  
International Airport  
Master Plan Update

FIGURE  
4.14

In order to provide sufficient space between the terminal and the roadway curb, this alternative proposes that the existing road in front of the terminal be shifted approximately 10 feet to the south. This shift would provide adequate space for passengers to load and unload from vehicles.

The alternative also proposes the construction of a parking garage that would provide one elevated level of parking. This garage would provide approximately 620 parking spaces that would accommodate projected demand. Access to and from the second level of the garage would be via ramps located at the south end of the garage.

The primary advantage of this concept is that it maximizes use of existing space and essentially maintains each terminal function in its current location. Its primary disadvantages would be the tremendous disruption to the passengers and tenants in the existing terminal during the construction process and the fact that vertical elevation changes via stairs and ramps would be required for all passengers and employees leaving and entering the terminal.

As depicted in Figure 4.14, passengers arriving at the terminal curb would have to use both stairs and ramps or elevators and escalators to enter the building. This is undesirable from a passenger convenience point of view and, in the case of elevators or escalators, a cost-to-operate point of view, because the operation of escalators and elevators can be expensive over the long run. This factor takes on added significance in a semi-tropical climate. The conceptual construction cost estimate for Concept A is \$23.5 million.

#### 4.3.2 TERMINAL CONCEPT B

Concept B, shown in Figure 4.15, is similar to Concept A except for one important difference. Concept B proposes the construction of an elevated roadway in front of the terminal. This would allow for direct access from the second level of parking garage, across the roadway and into the terminal.

A cross section of Concept B is provided in Figure 4.16. As the figure indicates, no change of elevation would be required for access from the roadway to the terminal. This would provide a significant improvement in convenience for the majority of passengers. While there would still be some passengers who park at the lower level of the parking garage and would be required to make a vertical transfer, the majority of passengers would not.

The primary advantage of Concept B is the reduction of vertical transfers and the improved passenger service as well as the reduced cost-to-operate associated with fewer vertical transfers. The primary disadvantage of the concept is the high cost associated with the construction of an elevated roadway.

Conceptual cost estimates for the elevated roadway depicted in Concept A are in the range of \$3.5 million. This is a significant investment for a small airport. The conceptual cost estimate for construction of Concept B is \$26.7 million.

### 4.3.3 TERMINAL CONCEPT C

Concept C proposes the construction of a new passenger terminal directly in front of the existing terminal as shown in Figure 4.17. Constructing the terminal in this location would allow for a larger amount of space to be constructed on the first floor because the existing ARFF station and the FIS building would no longer limit the west and east boundary of the site. This concept also proposes the construction of an elevated roadway in front of the terminal to minimize vertical transfers of passengers.

Because this concept consumes a substantial portion of the area where a parking garage is proposed for Concepts A and B, this concept proposes a substantially different arrangement for providing parking facilities. This concept proposes the construction a small elevated parking deck directly in front of the terminal. This parking ramp would provide some short-term parking and/or some spaces for rental car. Long-term parking and the bulk of rental car ready and rental car storage parking would be provided in a new two level parking garage in the area occupied by rental car storage lots and the department of Public Works. Access to this new garage could be provided via an elevated walkway from the terminal.

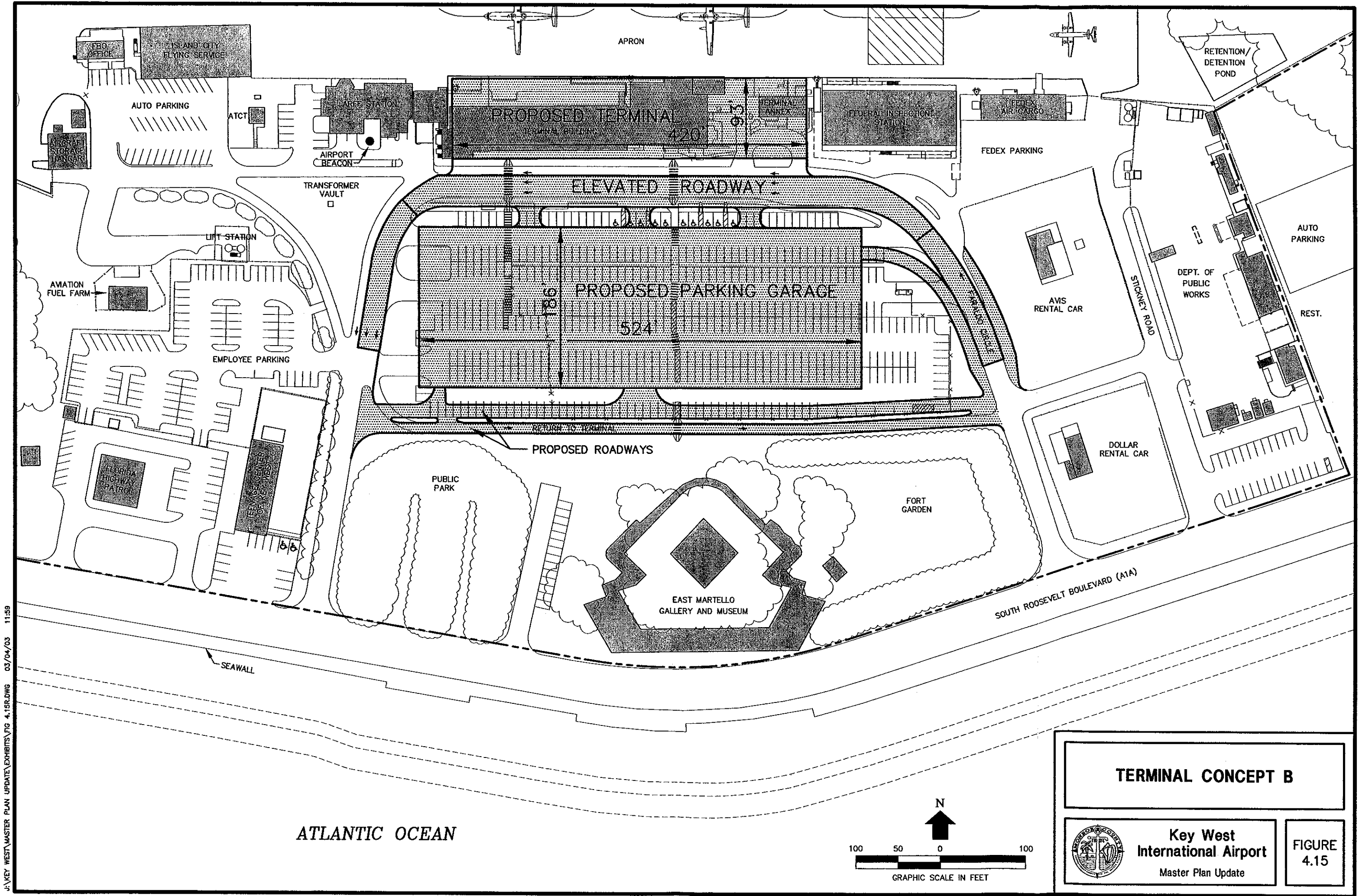
The primary advantage of this concept is that unlike Concepts A and B it would not require construction in the same location as the existing facility and therefore would reduce construction phasing problems and impacts to operations. However, the location of the proposed terminal would still have severe impacts upon existing access roadway and would require temporary walkways to the existing terminal.

The primary disadvantage of this concept is the overall use of land. First, the area occupied by the existing terminal would be of limited use because no aircraft would be able to park in this area. Consequently, this area would amount to excess and unusable ramp space. Second, this concept requires the use of land that is currently occupied by the rental car for the construction of the primary parking garage.

The conceptual cost estimate for construction of Concept C is \$27.6 million. Thus, Concept C is significantly more expensive than the two preceding concepts.

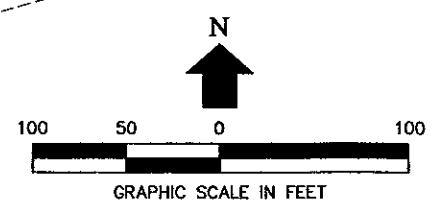
### 4.3.4 TERMINAL CONCEPT D

In the course of developing terminal concepts it became obvious that construction phasing and impacts to existing operations was a significant issue. Concept D was developed to address these issues. As shown in Figure 4.18, Concept D proposes the construction of a new passenger terminal on the south side of the existing access road with an elevated walkway across the existing roadway to a new concourse. This concept would allow the new terminal to be constructed with minimal impacts to the existing terminal or access road. The construction of the new concourse could be phased to minimize impacts to the existing terminal.



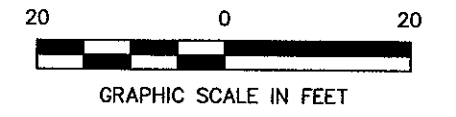
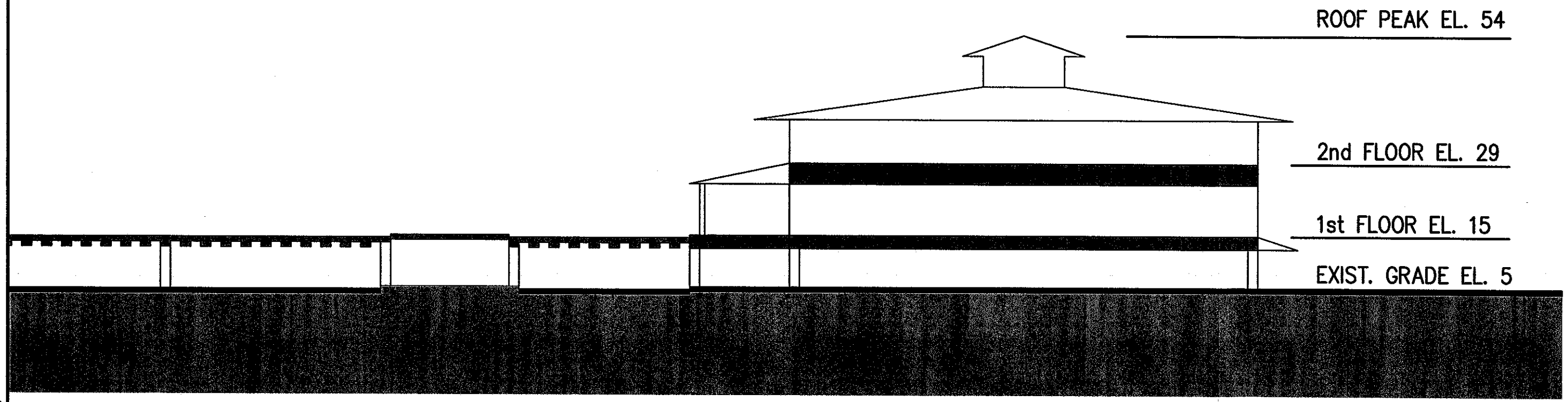
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<p><b>TERMINAL CONCEPT B</b></p>		
	<p><b>Key West International Airport</b></p>	<p><b>FIGURE 4.15</b></p>
	<p>Master Plan Update</p>	



ATLANTIC OCEAN





**TERMINAL CONCEPT B  
CROSS SECTION**

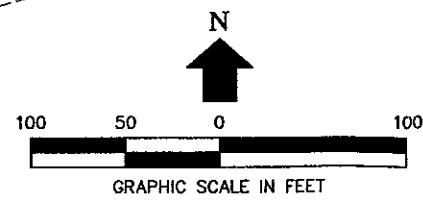
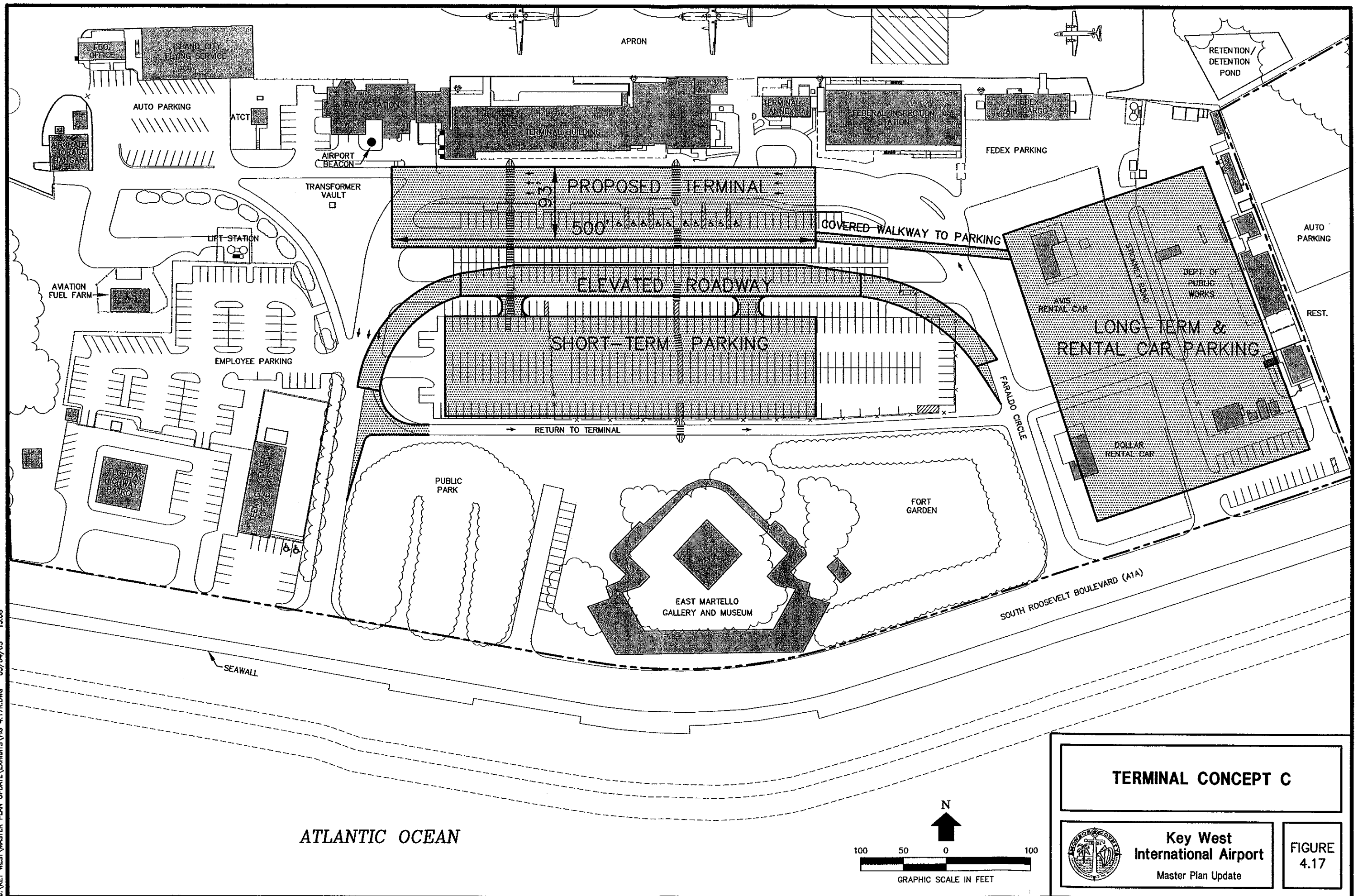


**Key West  
International Airport**  
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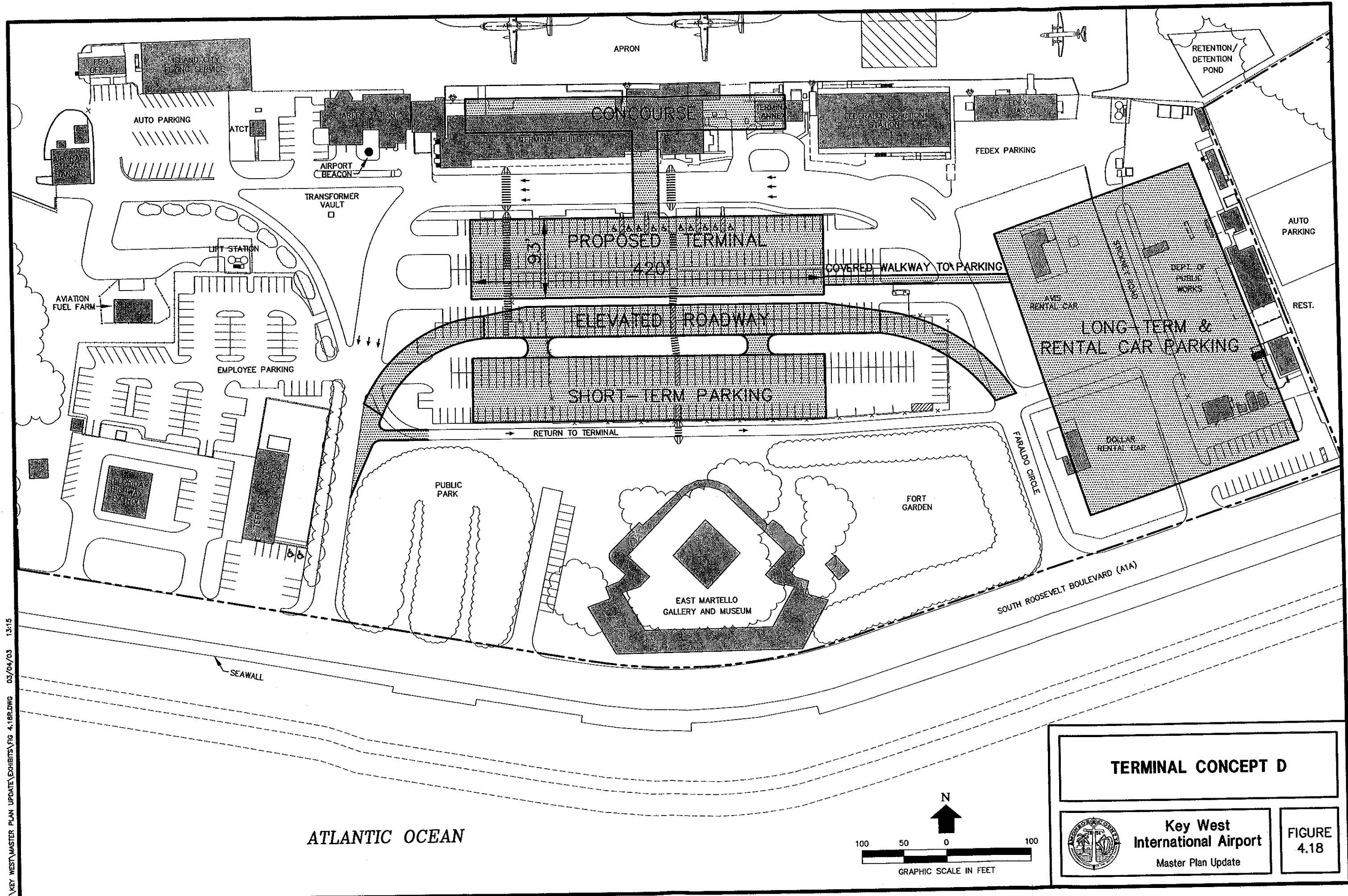
**FIGURE  
4.16**

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<b>TERMINAL CONCEPT C</b>	
	<b>Key West International Airport</b>
	Master Plan Update
<b>FIGURE 4.17</b>	



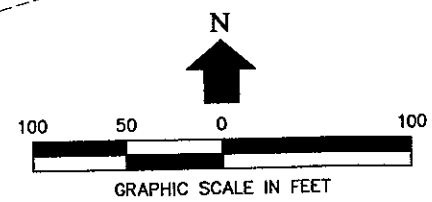
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### TERMINAL CONCEPT D



**Key West  
International Airport**  
Master Plan Update

**FIGURE  
4.18**



A cross section for Concept D is shown in Figure 4.19. As shown, the walkway from the terminal to the concourse would provide sufficient clearance for buses. This would allow traffic on Faraldo Circle to continue servicing the existing terminal while the new terminal is under construction.

Once the new facilities were in operation the existing terminal and roadway would be closed and demolished. The area currently used for these facilities would become operation areas for baggage make-up and delivery.

Access to the new terminal would be provided via an elevated access roadway as proposed in Concepts B and C. The parking facilities would be very similar to those proposed in Concept C except that the space available for the short-term parking deck would be less and would only accommodate some short-term parking. The majority of parking would be provided in a proposed parking garage east of Faraldo Circle.

The primary advantage of concept D is that it is far superior to the other concepts in terms of construction phasing and minimizing impacts to passengers and operations. Its primary disadvantage is its higher cost compared to the other alternatives. The conceptual cost estimate for construction of Concept D is \$33.5 million.

#### 4.3.5 TERMINAL CONCEPT E

Concept E, shown in Figure 4.20, is basically a variation of Concept B. It changes the location of access into the terminal area from Faraldo Circle to Stickney Road. The logic of this concept is that it would allow for the long-term future expansion of both the proposed terminal building and the parking garage. The ability to expand facilities in the future is typically a key factor when evaluating concepts. With respect to the passenger terminal, this concept would allow either the expansion into the FIS building or the demolition of this building and the expansion of the new terminal eastward at some point in the future. Likewise, for the parking garage this concept would allow for unrestricted expansion of the garage to the east since the ramp for the elevated roadway would be located at Stickney Road.

The primary disadvantage of this concept relative to the others is the higher costs associated with constructing a longer elevated roadway. The conceptual cost estimate for construction of Concept E is \$27.5 million.

#### 4.3.6 PREFERRED TERMINAL CONCEPT

In order to evaluate the merits of each terminal concept, evaluation criteria are needed. Therefore, the following criteria were established:

- Total Cost
- Passenger Convenience

- Safety and Security
- Construction Phasing
- Flexibility of Use
- Ability to Expand
- Impact on Access
- Impact on Operations

Concepts were ranked on a relative basis as to whether they were better, worse or the same as the other alternatives for each of these criteria. The comparison is depicted in Figure 4.21. Review of the comparison indicates that Alternative D is superior to the other alternatives in every category but cost.

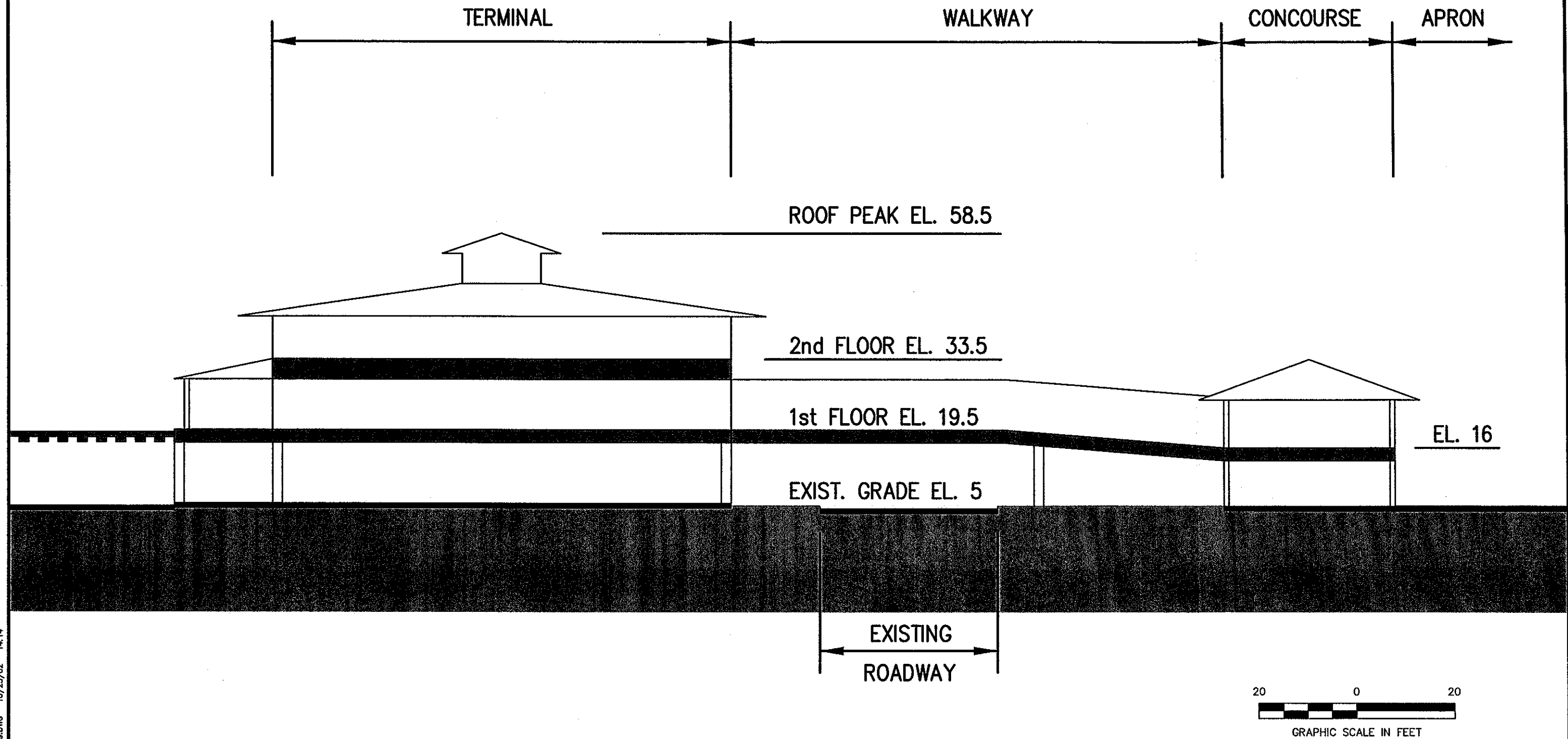
A presentation of the terminal alternatives was given to the Advisory Committee on August 20, 2002. Review of the alternatives by members of the advisory committee also revealed that the majority of the members believed that Alternative D was superior due to the other alternatives due to the reduced disruption that would occur to existing operations.

While Alternative D was judge to be superior, its cost presents a serious challenge to its feasibility. Thus, in an attempt to address this and other concerns, a revised version of Alternative D was prepared and is depicted in Figure 4.22. These revisions consisted of the following:

- The terminal was reduced from two floors to one floor.
- The size of the concourse was reduced to better meet the terminal space requirements.
- The long-term parking garage and walkway to the terminal was eliminated.
- The location of the walkway to the concourse was shifted to minimize impacts to the existing terminal during construction.
- The size of the elevated roadway was minimized
- A walkway and stairs to the Martello Museum was added.

As a result of all these changes, the preliminary construction cost of the alternative was reduced to \$20.6 million from \$33.5 million. However, consultation with airport management indicated that the feasibility of financing such a project was questionable considering that Monroe County typically does not bond airport projects. Therefore, an alternate short-term solution to terminal capacity

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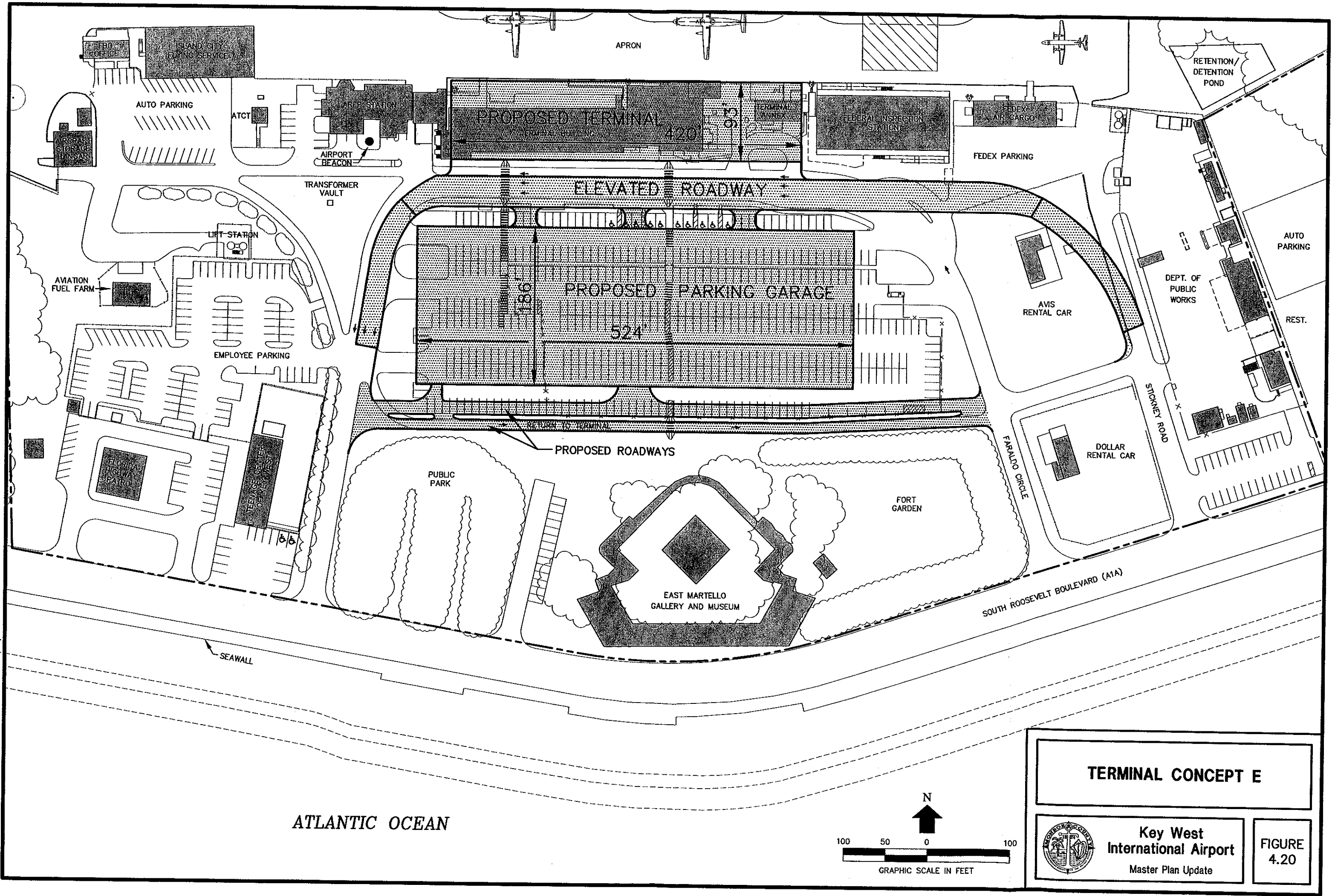
**TERMINAL CONCEPT D  
CROSS SECTION**



**Key West  
International Airport**  
Master Plan Update

**FIGURE  
4.19**


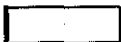





Total Cost  
 Passenger Convenience  
 Safety and Security  
 Construction Phasing  
 Flexibility of Use  
 Ability to Expand  
 Impact on Access  
 Impact on Operations

Terminal Concept				
A	B	C	D	E

#### Legend

-  Ranks Favorably Compared to Other Alternatives
-  Ranks Neutral Compared to Other Alternatives
-  Ranks Unfavorably Compared to Other Alternatives

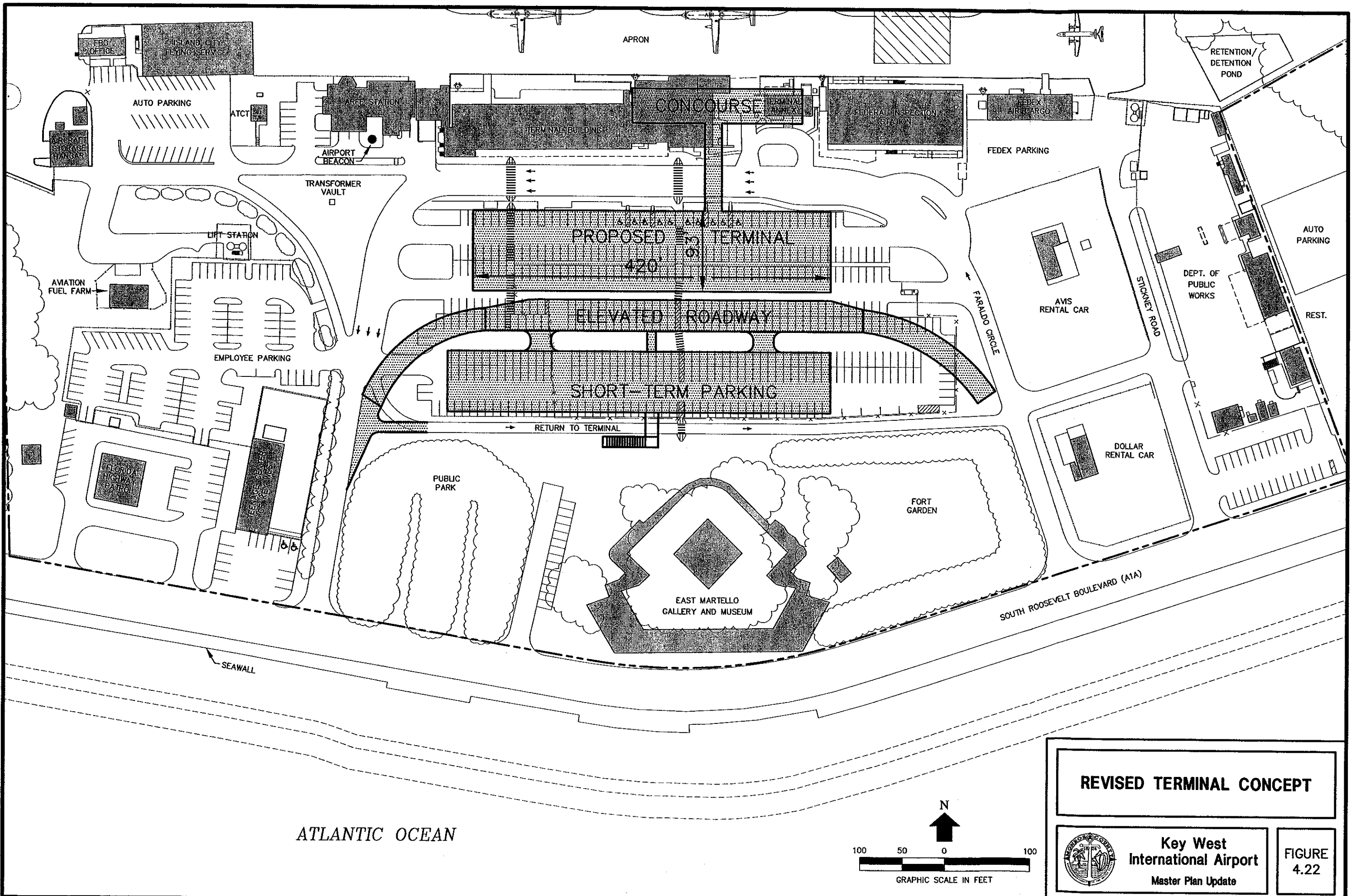


**Key West**  
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 Master Plan Update

### TERMINAL CONCEPT EVALUATION

FIGURE:  
 4.21





REVISED TERMINAL CONCEPT



Key West  
International Airport  
Master Plan Update

FIGURE  
4.22

constraints was also prepared. This solution consists of constructing a new elevated building between the existing terminal and the FIS building as depicted in Figure 4.23.

The new building would be connected to the existing terminal and would eliminate the existing Cape Air annex. Approximately 8,000 square feet of new terminal space could be provided in this area. This would enable the airport restaurant and some other terminal functions to be relocated into the new building. Space vacated in the existing terminal could be reused for airline functions.

The elevated building would have a construction cost in the range of \$4 million including the cost of renovating space in the existing terminal. This option is within the financial capabilities of the airport on a pay-as-you-go basis. The exact dimensions layout and function of the new building and reuse of the existing terminal building would be determined through the design process.

#### 4.4 AIRCRAFT RAMP ALTERNATIVES

During the first Advisory Committee meeting held during the preparation of the master plan update, concerns were expressed by committee members regarding the use of the aircraft ramp. These concerns focused on two issues: 1) the safety of passengers walking across the ramp to and from aircraft and 2) the overall efficiency of the current aircraft parking arrangement. With respect to the passenger safety issue, committee members indicated that due to the high volume of aircraft operations on the ramp and the considerable distances that some passengers walk across the ramp, there is a potential for an accident to occur. Consequently, airline personnel must be exceptional vigilant in controlling the movement of passengers during the loading and unloading process. Committee members suggested that alternate methods of controlling passenger movement to and from the aircraft be examined. With respect to the issue of the efficiency of the existing aircraft parking configuration, committee members indicates that they believe alternative parking configurations could potentially increase the number of parking positions on the ramp.

The master plan considered both of these issues and developed alternatives that attempted to address both of these concerns. These alternatives are discussed and depicted in the following paragraphs and figures.

##### 4.4.1 AIRCRAFT RAMP ALTERNATIVE 1

Alternative 1 is the existing aircraft ramp configuration as depicted in Figure 4.24. This parking configuration yields 11 parking spaces for commercial passenger aircraft and one parking space for Federal Inspection Services associated with the United States Customs Service. The configuration allows any airline aircraft to use any parking space. All spaces are sized to accommodate the aircraft with the greatest wingspan currently operating at the airport (i.e., DASH-8).

The major advantage of this alternative is the flexibility of allowing any aircraft to park in any parking position and the relatively large amount of space provided between aircraft which allows for easy servicing of aircraft by fuel trucks, baggage carts, etc. The major disadvantages are those

previously discussed above (i.e., the large amount of space consumed thereby reducing the number of parking positions available and the operational safety concerns).

#### 4.4.2 AIRCRAFT RAMP ALTERNATIVE 2

Alternative 2 proposes the construction of a covered walkway out across the aircraft ramp as shown in Figure 4.25. The purpose of the covered walkway would be to centralize the flow of passengers within the limits of the walkway and to provide a certain measure of weather protection. By having all passengers walk within the confines of the walkway and having aircraft park around its perimeter, passengers would be controlled in a safe corridor and would not pass around operating aircraft. The walkway would also provide a limited amount of protection from sun and light rains.

From an operational point of view, aircraft would park in a taxi-in / taxi-out configuration as they do today, but would require that aircraft turnaround and taxi-out in the opposite direction. This should not present a problem, since it is common method of operations at other airports. This parking configuration would also require that two taxiway islands adjacent to Taxiway A be paved to allow aircraft parked at the end of the walkway to taxi in and out of position.

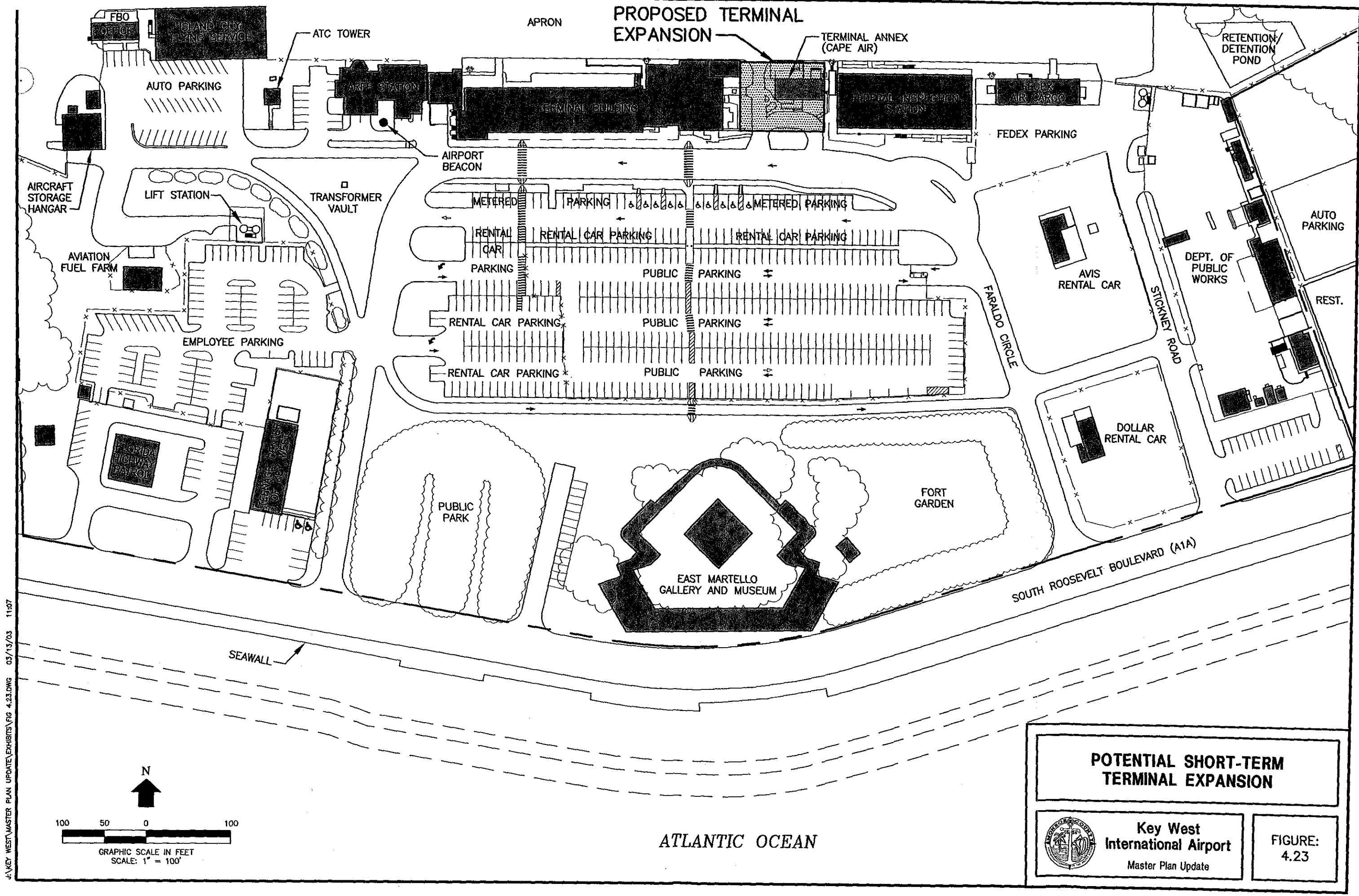
As depicted in Figure 4.25, the proposed configuration would provide for eight parking positions (including a combined position for two small aircraft) and could include three regional jet parking positions. Additional parking positions for three additional aircraft would remain the same as they operate today. While this is not desirable, it should be kept in mind that these positions are primarily used only at the beginning and end of the day.

The primary advantage of constructing a covered walkway is that it is a relatively low-cost solution to addressing passenger safety concerns. Preliminary construction cost estimates indicate that construction of a walkway of the size shown in Alternative 2 would cost in the range of \$500,000. The primary disadvantage is that there will still be three aircraft parking positions that would be remote from the walkway.

#### 4.4.3 AIRCRAFT RAMP ALTERNATIVE 3

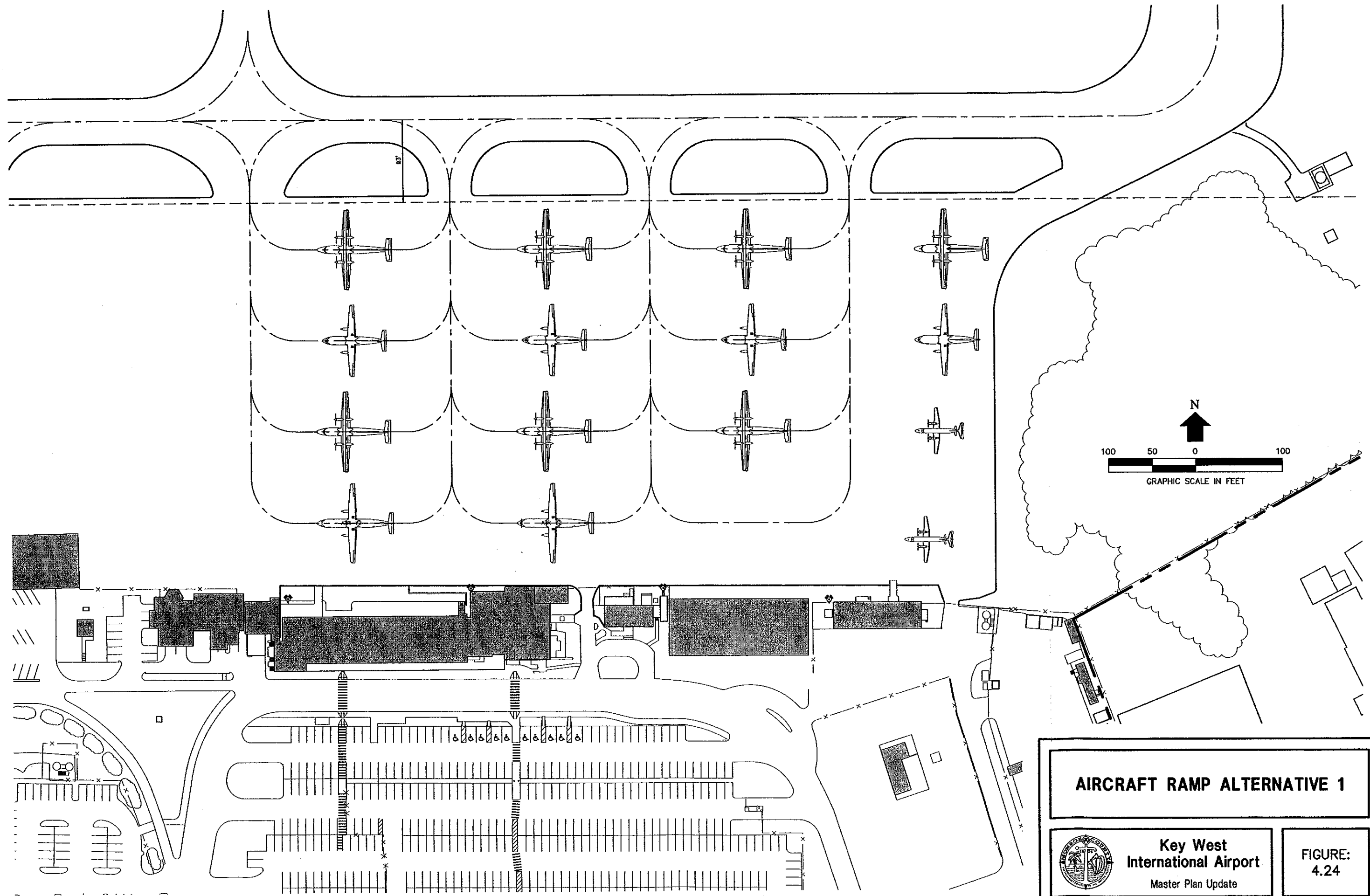
Aircraft Ramp Alternative 3 proposes the incorporation of a concourse into one of the new passenger terminal concepts. A concourse would consist of a completely enclosed, air conditioned and elevated building similar to the passenger terminal. It would provide complete weather protection for passengers and would allow for the use of boarding bridges common at other airports.

Figure 4.26 depicts a linear concourse constructed along with a new passenger terminal. The concourse would consist of a central circulation corridor with passenger holdrooms on each side of the corridor. The concourse could be operated with either a taxi-in / taxi out operation without loading bridges or a taxi-in / push-back operation with loading bridges. Figure 4.26 depicts a mixed fleet of regional jets and turboprop aircraft. With this type of mixed fleet, the concourse could



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<b>POTENTIAL SHORT-TERM TERMINAL EXPANSION</b>	
	<b>Key West International Airport</b> Master Plan Update
<b>FIGURE: 4.23</b>	



**AIRCRAFT RAMP ALTERNATIVE 1**



**Key West  
International Airport**  
Master Plan Update

**FIGURE:  
4.24**